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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/808,714 | 03/14/2001 | Volker Drexel | (Z) 00022 P US | 5823 |
| 7590 | 01/11/2005 | | EXAMINER | |
| M. Robert Kestenbaum 11011 Bermuda Dunes NE Albuquerque, NM 87111 | | | JOHNSTON, PHILLIP A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2881 | |

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/808,714

Applicant(s)

DREXEL ET AL.

Examiner

Phillip A Johnston

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4-22-2004, 6-29-2004, and 9-01-2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

1. This Office Action is submitted in response to the petition to revive, granted 6-29-2004; as well as amendments filed 4-22-2004, and 9-01-2004, wherein claims 1-14 were previously cancelled, claims 15-31 were previously presented, and claims 32-45 were added. Claims 15-45 are pending.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

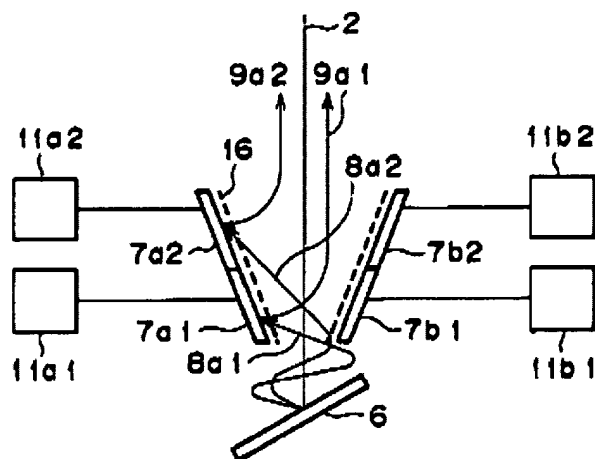
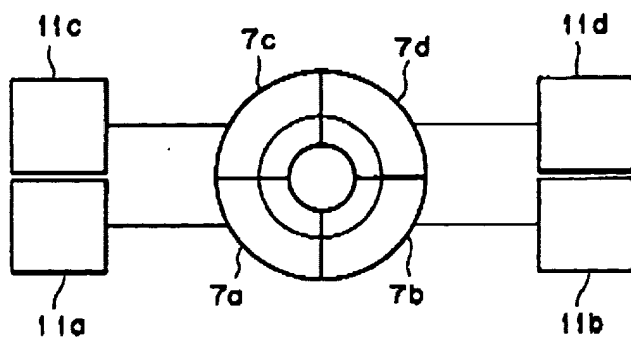
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 15, 18-34, and 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,501,077 to Sawahata, in view of Todokoro, U.S. Patent No. 5,424,541.

Sawahata (077) discloses the following;

(a) A detection system that, utilizes a secondary electron conversion electrode 7, divided into plural parts arranged around an electron beams optical axis, where region 7a2 is remote from region 7a1, as recited in claims 15,18,19,25,27,32 and 40. See Figure 4 below; and Column 8, line 19-38;

FIG. 4



(b) A scanning electron microscope having variable electrostatic and magnetic deflectors, as recited in claims 20-23,28,30,31,37-39,42,44, and 45. See Figure 1 below; and Column 4, line 33-64;

The diagram illustrates a laser system for a lithographic apparatus. At the top, a rectangular block labeled 1 is connected to a vertical line 2. This line passes through a series of components: a horizontal block 18, a horizontal block 17, and a horizontal block 8b2. Below 8b2 is a large rectangular block 8b1. A line from block 11d enters block 8b1 from the left, labeled 12b. A line from block 5b enters block 8b1 from the right, labeled 9b1. Below block 8b1, there are two pairs of square blocks with an 'X' inside, labeled 3a and 3b. A vertical line continues from below 3b, passing through a block 12a. To the left of block 12a are three square blocks labeled 11c, 11b, and 11a. To the right of block 12a, a line labeled 9a leads to a block 5a. Below block 12a, there are two angled blocks labeled 8a and 7. These blocks are positioned above a central assembly consisting of a spring 6 and a platform 4. To the right of the central assembly, there is a vertical line 14 that passes through a block 15. The entire system is enclosed within a large rectangular frame.

(d) The conversion electrode at a positive potential, as recited in claim 24. See column 5, line 39-53.

It is implied herein that conversion electrode 7 is made of a sufficiently strongly electron converting material, so that when secondary electrons (emitted from a sample bombarded by a primary beam) strike the conversion electrode, new secondary electrons will be emitted therefrom.

Sawahata (077) as applied above fails to teach the use of a beam guide tube, as recited in claims 27, 29, 33, and 43. However, Todokoro (541) discloses an electron microscope having an electron beam passing through a channel cylinder 21 (beam tube), and a detector located outside cylinder 21 through opening 22. See Column 4, line 4-24; and line 54-64.

Therefore it would have been obvious to one of ordinary skill in the art that the electron microscope apparatus and detection system of Sawahata (077) can be modified to use the channel cylinder of Todokoro (541), to cover an electron channel extending from a field-emission-type electron gun to an objective, which forms an acceleration electric field in the channel cylinder, a deceleration electric field forming means for forming a deceleration electric field for a primary electron beam between the objective and a sample, and a secondary signal detecting means for detecting secondary signals attracted into the channel cylinder on the electron source side of the objective.

4. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawahata (077) and Todokoro (541) in view of Reimer, U.S. Patent No. 4,308,457.

Sawahata (077) and Todokoro (541) disclose nearly all the limitations of claim 16, but fail to disclose the use of a web/ring shaped electrode structure. However, Reimer (457) discloses converter plates that also consist of concentric rings or represent a combination of segments and rings. See Column 4, line 55-68.

Therefore it would have been obvious to one of ordinary skill in the art that the electron microscope apparatus and detection system of Sawahata (077) and Todokoro

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(541) can be modified to use the ring shaped converter plate of Reimer (457), to provide a segmented electrode that is independently actuated with regard to permeability by the secondary electrons, by the application of different potentials.

5. Claims 17 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawahata (077), Todokoro (541) and Reimer (457) and in further view of Honjo, U.S. Patent No. 5,384,463.

Sawahata (077), Todokoro (541) and Reimer (457) disclose nearly all the limitations of claims 17 and 35, but fail to disclose the use of a target structure having a region of weakly electron-converting material. However, Honjo (463) discloses in Figure 34 (a), a reference pattern formed from a combination of a light element, having a relatively small atomic weight and a heavy element, such as tantalum. The electron beam is irradiated across the pattern in the same manner. Because of the differences in atomic weight, a difference is induced in the generation of backscattered or secondary electrons so that a current variation curve Lc as shown in FIG. 34(b) is obtained while shifting the beam from position A to the position C. See Figure 34(a) and (b) below; Column 23, line 65-68; and Column 24, line 1-11.

Fig. 34(a)

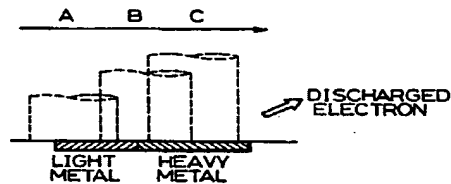
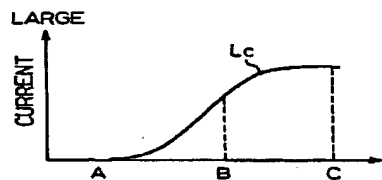


Fig. 34(b)



Therefore it would have been obvious to one of ordinary skill in the art that the electron microscope apparatus and detection system of Sawahata (077), Todokoro (541) and Reimer (457) can be modified to use the beam target structure of Honjo (463), to provide a target having two different electron converting materials to detect a difference induced in the generation of backscattered or secondary electrons.

Conclusion

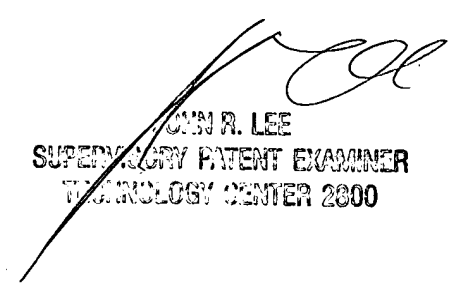
6. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 703 872 9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

January 4, 2005



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800